

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

These amendments introduce no new matter and support for the amendments is replete throughout the application as originally filed. These amendments are made without prejudice and are not to be construed as abandonment of the previously claimed subject matter, or agreement with any objection or rejection of record.

Listing of Claims:

Claim 1 (Original): A method of controlling carotenoid accumulation in at least one pineapple cell, the method comprising introducing at least one carotenoid biosynthetic polypeptide expression regulator into said pineapple cell, wherein said carotenoid biosynthetic polypeptide expression regulator controls accumulation of carotenoid in said pineapple cell.

Claim 2 (Currently Amended): The method of claim 1, wherein said pineapple cell is an embryogenic cell, an embryogenic callus cell, an organogenic cell, or an organogenic callus cell.

Claims 3-6: Canceled

Claim 7 (Original): The method of claim 1, wherein said carotenoid biosynthetic polypeptide expression regulator increases accumulation of carotenoid in said pineapple cell relative to an accumulation of carotenoid in a pineapple cell that lacks said carotenoid biosynthetic polypeptide expression regulator.

Claim 8 (Original): The method of claim 1, wherein said carotenoid biosynthetic polypeptide expression regulator decreases accumulation of carotenoid in said pineapple cell relative to an accumulation of carotenoid in a pineapple cell that lacks said carotenoid biosynthetic polypeptide expression regulator.

Claim 9 (Original): The method of claim 1, wherein said carotenoid biosynthetic polypeptide expression regulator controls accumulation of one or more carotenoids that are selected from group consisting of: phytoene, phytofluene, ζ -carotene, neurosporene, δ -carotene, γ -carotene, α -carotene, β -carotene, apocarotenal, lycopene, canthaxanthin, zeaxanthin, and lutein.

Claims 10-13: Canceled

Claim 14 (Currently Amended): The method of claim 1, wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide, which nucleic acid segment stably integrates into the genome of said pineapple cell;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one sense nucleic acid segment that corresponds to at least a portion of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one antisense nucleic acid segment that corresponds to at least a portion of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide transcription factor;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide promoter and/or at least one carotenoid biosynthetic polypeptide enhancer, which nucleic acid segment homologously recombines with at least one promoter and/or at least one enhancer of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide that is heterologous to said pineapple cell; or,

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide that is homologous to at least one endogenous carotenoid biosynthetic polypeptide of said pineapple cell.

Claim 15 (Original): The method of claim 1, wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide, which nucleic acid segment is linked to a selectable marker.

Claim 16 (Currently Amended): The method of claim 1, wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide, which nucleic acid segment is operably linked to a constitutive promoter or to an inducible promoter.

Claims 17-30: Canceled

Claim 31 (Original): The method of claim 1, wherein said pineapple cell is an organogenic cell produced by culturing at least one meristemic cell.

Claim 32 (Original): The method of claim 31, wherein said meristemic cell is a non-apical meristemic cell.

Claim 33 (Original): The method of claim 31, wherein said culturing comprises culturing said meristemic cell to produce at least one shoot, and culturing at least one explant from said shoot to produce said organogenic cell.

Claims 34-38: Canceled

Claim 39 (Original): A method of altering pineapple plant coloration, the method comprising introducing at least one carotenoid biosynthetic polypeptide expression regulator into at least one pineapple plant, wherein said carotenoid biosynthetic polypeptide expression regulator controls accumulation of at least one colored carotenoid in said pineapple plant, thereby altering said coloration of said pineapple plant.

Claims 40-42: Canceled

Claim 43 (Original): The method of claim 39, wherein said colored carotenoid is selected from group consisting of: phytoene, phytofluene, ζ -carotene, neurosporene, δ -carotene, γ -carotene, α -carotene, β -carotene, apocarotenal, lycopene, canthaxanthin, zeaxanthin, and lutein.

Claims 44-47: Canceled

Claim 48 (Currently Amended): The method of claim 39, wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide, which nucleic acid segment stably integrates into the genome of said pineapple plant;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide, which nucleic acid segment is operably linked to a promoter that promotes fruit-specific expression of said carotenoid biosynthetic polypeptide;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one sense nucleic acid segment that corresponds to at least a portion of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one antisense nucleic acid segment that corresponds to at least a portion of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide transcription factor;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide promoter and/or at least one carotenoid biosynthetic polypeptide enhancer, which nucleic acid segment homologously recombines with at

least one promoter and/or at least one enhancer of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide that is heterologous to said pineapple plant; or,

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide that is homologous to at least one endogenous carotenoid biosynthetic polypeptide of said pineapple plant.

Claims 49-65: Canceled

Claim 66 (Original): The method of claim 39, wherein said carotenoid biosynthetic polypeptide expression regulator is introduced into at least one pineapple cell from which said pineapple plant is regenerated.

Claims 67 and 68: Canceled

Claim 69 (Original): A pineapple cell that comprises at least one introduced carotenoid biosynthetic polypeptide expression regulator, which carotenoid biosynthetic polypeptide expression regulator controls accumulation of carotenoid in said pineapple cell.

Claim 70 (Currently Amended): The pineapple cell of claim 69, wherein said pineapple cell is an embryogenic cell, **an embryogenic callus cell, an organogenic cell, or an organogenic callus cell.**

Claims 71-76: Canceled

Claim 77 (Original): The pineapple cell of claim 69, wherein said carotenoid biosynthetic polypeptide expression regulator controls accumulation of one or more carotenoids that are selected from group consisting of: phytoene, phytofluene, ζ -carotene, neurosporene, δ -carotene, γ -carotene, α -carotene, β -carotene, apocarotenal, lycopene, canthaxanthin, zeaxanthin, and lutein.

Claims 78-84: Canceled

Claim 85 (Currently Amended): The pineapple cell of claim 69, wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide that is selected from the group consisting of: an isopentenyl diphosphate isomerase, a geranylgeranyl pyrophosphate synthase, a phytoene synthase, a phytoene desaturase, a ζ -carotene desaturase, a lycopene β -cyclase, a lycopene ϵ -cyclase, a β -carotene hydroxylase, and an ϵ -hydroxylase;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one sense nucleic acid segment that corresponds to at least a portion of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one antisense nucleic acid segment that corresponds to at least a portion of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide transcription factor;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide promoter and/or at least one carotenoid biosynthetic polypeptide enhancer, which nucleic acid segment homologously recombines with at least one promoter and/or at least one enhancer of at least one endogenous carotenoid biosynthetic polypeptide gene;

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide that is heterologous to said pineapple cell; or,

wherein said carotenoid biosynthetic polypeptide expression regulator comprises at least one nucleic acid segment that encodes at least one carotenoid biosynthetic polypeptide that is homologous to at least one endogenous carotenoid biosynthetic polypeptide of said pineapple cell.

Claims 86-96: Canceled

Claim 97 (Original): A pineapple plant that is regenerated from said pineapple cell of claim 69.